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AND

PROCEEDINGS

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Two new North American Dragonflies (Odonata).

BY E. B. WILLIAMSON.

Boyeria grafiana n. sp.

Abdomen ♂, 48-51; ♀, 46½-47½ mm.

Hind wing ♂, 40-43; ♀, 43 mm.

Specific characters: Body colors, especially the thorax, generally black and grav with little trace of the fulvous which characterizes *B. vinosa.* The dark brown basal wing spots of *vinosa* reduced to a trace, and the wing membrane clear hyaline (excepting more or less fumose beyond the stigma) as contrasted with the decided fulvous of *vinosa;* venation less complex than in *vinosa.* Stigma paler than in *vinosa* and .5 mm. shorter. A decidedly more robust species than *vinosa;* four dried males of *grafiana* weighed 12 grains, and four of *vinosa* weighed 9½ grains.

♂.—Abdominal appendages variable but similar to those of *vinosa,* generally more robust (two males of *grafiana* and *vinosa* from Ohio Pyle, Penna., Sept. 23, 1906, have the superior appendages respectively 4½ and 5½ mm. long) with the sub-basal inferior tooth less developed, and the inferior appendage dark colored and not yellow as in *vinosa.* Abdominal segments 9 and 10 similar in general color, greenish blue, while in *vinosa* segment 10 is fulvous and 8 and 9 are decidedly more brown than 10.

♀.—Abdominal appendages very short, about the length of segment 10; in *vinosa* the appendages are at least 1½ times the length of 10.

Color comparison of males based on two of each species collected by J. L. Graf at Ohio Pyle Penna., Sept. 23, 1906.

B. vinosa.	*B. grafiana.*
Face green obscured with brownish.	Clear green.
Dorsal thoracic stripes narrow, each divided for a short distance.	Wider, continuous but narrowed where the separation occurs in *vinosa.*
Mesepimeron and metepimeron each with an inferior rounded yellow spot.	Each with a rounded blue spot, the spot on the metepimeron showing traces of yellow.
Mesepimeron and metepisternum each with a small bluish spot at base of wings.	Spots larger and more distinctly blue.
Metepimeron uniform brown with exception of yellow spot mentioned above.	With a large distinct blue spot at wing base.
Wing bases above and between the wings with few inconspicuous blue spots.	With distinct and more numerous clear blue spots.
Abdominal segment 2 from above with small median basal spot, and a transverse apical spot which is interrupted at the median line.	Similar and also with a spot at the median transverse carina similar to the apical spot.
Segments 3-5 each with a very small apical spot on either side of the median line.	Spots clearer and more sharply contrasted with the surrounding color.
Segments 3-8 each with a very small obscure pale spot at the transverse carina, each spot divided by the dorsal median longitudinal carina.	Spots clear blue, sharply defined.
Apical half of 8 and all of 9 and 10 obscure brownish yellow, each with a dorsal median brown area; 10 decidedly more yellow than 8 and 9.	8 brownish with a wide black median longitudinal stripe back of the transverse carina; 9 and 10 pale greenish blue, but little if any obscured and with black markings more distinct and definite than the brown markings in *vinosa.*
Seen from the side segments 4-8 each with a very small obscure yellowish spot below, the transverse carina dividing each spot more or less completely into two spots.	Spots large, clear blue, the color following up the transverse carina to the dorsal spots.
Superior appendages dark brown, inferior yellow, extreme apex dark.	Both superiors and inferior dark brown.
Width of head, 9 mm.	10 mm.

Venational characters based on tabulation of 10 males of each species.

Antenodals in front wing	17	18	19	20	21	22	23	24	25	26		Average.
Boyeria vinosa		1=5%	1=5%		3=15%	4=20%	3=15%	5=25%	1=5%	2=10%		22.7
Boyeria grafiana	1=5%	2=10%	1=5%	5=25%	2=10%	6=30%	2=10%	1=5%				20.8
Antenodals in hind wing	13	14	15	16	17	18	19	20				
Boyeria vinosa	1=5%	1=5%		4=20%	6=30%	4=20%	3=15%	1=5%				17.1
Boyeria grafiana		1=5%		11=55%	8=40%							16 25
Postnodals in front wing	15	16	17	18	19	20	21	22	23			
Boyeria vinosa				1=5%	10=50%	2=10%	3=15%	1=5%	3=15%			20.1
Boyeria grafiana	1=5%	3=15%		2=10%	6=30%	5=25%	1=5%	2=10%				18 8
Postnodals in hind wing	17	18	19	20	21	22	23	24				
Boyeria vinosa	2=10%	2=10%	2=10%	3=15%	2=10%	3=15%	3=15%	3=15%				20.85
Boyeria grafiana	4=20%	7=35%	3=15%	3=15%	1=5%		1=5%					17.75
Cross veins in median space of front wing	3	4	5	6	Same of hind wing.				3	4	5	6
Boyeria vinosa		2=10%	12=60%	6=30%						5=25%	13=65%	2=10%
Boyeria grafiana	1=5%	16=80%	2=10%	1=5%					6=30%	12=60%	2=10%	
Cross veins in cubital space of front wing, not counting one forming subtriangle	3	4	5	6	7	Same of hind wing.			3	4	5	6
Boyeria vinosa	1=5%	9=45%	7=35%	3=15%					1=5%	11=55%	6=30%	2=10%
Boyeria grafiana		10=50%	9=45%		1=5%				2=10%	13=65%	5=25%	
Transverse cross veins in triangle of front wing	3	4	5	Same of hind wing	2	3	4	Cells in anal triangle.		3	4	5
Boyeria vinosa	6=30%	12=60%	2=10%		1=5%	13=65%	6=30%			6=30%	2=10%	12=60%
Boyeria grafiana	11=55%	9=45%			5=25%	14=70%	1=5%			15=75%	1=5%	4=20%
Rows of cells between M_2 and R_5 at widest point	3	4	Rows of cells between R_5 and radial supplement in front wing.				1	2	Same in hind wing.		1	2
Boyeria vinosa	21=52.5%	19=47.5%					6=30%	14=70%			11=55%	9=45%
Boyeria grafiana	40=100%[1]						6=30%	14=70%			16=80%	4=20%
Rows of cells between M_4 and median supplement	1	2	Rows of cells between Cu_2 and hind margin of wing at widest point in hind wing.					4	5	6	7	8
Boyeria vinosa	4=10%	36=90%							2=10%	5=25%	12=60%	1=5%[2]
Boyeria grafiana	10=25%	30=75%						1=5%	3=15%	15=75%	1=5%	

[1] In front wing of a ♂ from Searchmont, Ontario, practically only 2 rows, as there is only one transverse row of 3 cells.

[2] In this ♂ from Muncie, Indiana, in one front wing and both hind wings Sc is carried beyond the nodus the length of one cell.

Material studied.—With the exception of two males of *vinosa* and one male of *grafiana,* all from Old Forge, N. Y., in the collection of Professor Needham, this material is in my collection. Fifty-two males and seven females of *vinosa,* and fourteen males and two females of *grafiana* have been studied.

B. vinosa.—Little Jelloway, Knox County, Ohio. August 18, 1905, ♂, J B. Parker.

Winona Lake, Indiana, 1901, ♂, E. B. Williamson.

Muncie, Indiana, July 11, 1903, taken in window in a store, ♂, E. B. Williamson.

Russell Stream, N. E. Carry, .Maine, August 28, 1899, 8 ♂♂, F. L. Harvey.

Millinocket, Maine, Stone Dam, September 4, 1903, ♀, indicated as taken in copulation with a ♂ *Æshna sp.*

Old Forge, New York, August 22, 1905, 2 ♂♂, J. G. Needham.

Ohio Pyle, Penna. All collected by J. L. Graf. September 8, 1901, 3 ♂♂; September 10, 1905, 8 ♂♂, 4 ♀♀; October 1, 1905,, 2 ♂♂; September 23, 1906, 2 ♂♂, 1 ♀.

Heyden, Ontario, Canada. Collected by E. B. Williamson. July 31, 1906, ♀; August 2, 1906, 5 ♂♂; August 3, 1903, ♂.*

Searchmont, Ontario, Canada. Collected by E. B. Williamson. August 6, 1906, 7 ♂♂; August 7, 1906, 3 ♂♂; August 8, 1906. 6 ♂♂; August 9, 1906, 2 ♂♂.

B. grafiana.—Cave Branch, Ky., August 28, 1898, ♂, J. S. Hine.

Old Forge, New York, August 22, 1905, ♂, J G. Needham.

Ohio Pyle, Penna. Collected by J. L. Graf. September 10, 1905, ♂; September 24, 1905, ♂; October 1, 1905, ♂; September 23, 1906, 2 ♂♂.

Heyden, Ontario, Canada. Collected by E. B. Williamson. August 2, 1906, ♂.

Searchmont, Ontario, Canada. Collected by E. B. Williamson. August 6, 1906, 2 ♂♂; August 8, 1906, 3 ♂♂; August 9, 1906, ♂, 2 ♀♀.

This species is very properly named for J. L. Graf, a devoted and careful, though withal, silent student of nature, who first detected a difference in the Boyerias at Ohio Pyle. In the autumn of 1905, among a box of specimens he sent me, he indicated on the envelope of a Boyeria, "colors peculiar." In reply to my inquiry, under date of October 4,

*Hawking after sunset.

1905, he wrote, "The variety of *B. vinosa* you mention is not uncommon at Ohio Pyle. I have succeeded in taking three specimens, though I saw a number of others. Their difference from typical *vinosa* is apparent at a glance, even while they are on the wing, their pale blue markings in marked contrast to the almost uniform brown appearance of typical *vinosa*. In manner of flight I could detect no difference in the two varieties. They both prefer the ripples along the river where there are many stones, and their flight is usually just along the water's edge and but a few inches above the rocks. I observed females of typical *vinosa* ovipositing while at rest on rocks in the damp algæ just above the water." In Canada I was able to distinguish the two species readily on the wing by the color of the apical abdominal segments.

As above indicated, I am indebted to Professor Needham for three specimens studied. In his laboratory we examined together some of my material, and he regards *grafiana* as distinct from *vinosa*. Dr. Calvert has sent me notes on venational characters of specimens of the genus in Philadelphia. And on October 11, 1905, Professor Hine wrote me, "There is in the collection here (O. S. U., Columbus, Ohio,) one specimen taken at Orwell, Ashtabula County, Ohio, September, 1894, by E. E. Bogue, and labelled *vinosa*, by Dr. Kellicott. This dragonfly has the characters you mention of the new species."

Somatochlora charadræa n. sp. (*charadræus* Gr., from a mountain torrent).

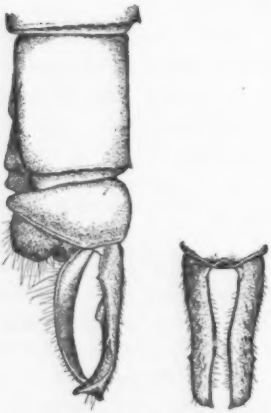
Abdomen, ♂ 35; hind wing 35 mm. (*S. linearis*, abdomen 45, hind wing 43).

Labium pale yellow; labrum dark yellow, edged with brown; clypeus brown; frons dark yellow, for nearly its entire width above and for a short distance in front, metallic blue; vertex black, the apex yellow; occiput dull yellow; rear of eyes black.

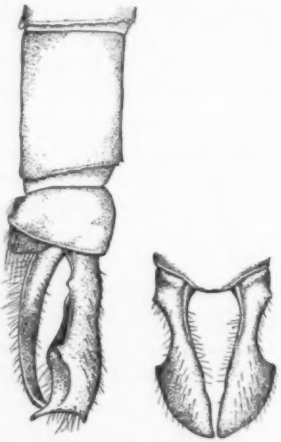
Thorax brown, metallic reflections most evident below on the mesepimeron and metepimeron, each of which has a bright yellow stripe, on the first of nearly uniform width and nearly the length of the sclerite, on the second widened and shortened to form an inferior rounded spot; middorsal carina and interalar sclerites yellow. Costa pale yellow to its termination, and antenodals and nodus largely of the same color; stigma black; all four triangles once crossed;* seven

*Needham, Aquatic Insects in the Adirondacks, N. Y. State Museum, Bulletin 47, 1901, p. 484, in the Key to N. A. genera of Cordulinæ (s. str.) erroneously places *Somatochlora* under his section "*cc* Triangle of hind wing without cross vein, open." Normally *Somatochlora* has this triangle once crossed. Of 40 hind wings of *Somatochlora elongata* which I studied, the triangle in two left wings was not crossed.

antenodals in front wings and five in hind wings; seven postnodals in front wings and eight and nine in hind wings. Legs black, femora of first and second pair, especially the first pair and especially on the inner surface and basally, with light brown.



Figs. 1 and 2.—Appendages of *Somatochlora charadræa*, Bear Creek, Canon, Jefferson Co., Colorado, July 31, 1898, E. J. Oslar, collector. Type ♂, collection E. B. Williamson.



Figs. 3 and 4.—Appendages of *Somatochlora linearis*, Lake Forest, Illinois, June 27, 1904. ♂, collection J. G. Needham.

Second abdominal segment with a basal, lateral, inferior and a subapical, lateral, superior spot yellow; genital lobe long, yellow, margined with brown; 3 with a basal, lateral, superior and a basal, lateral, inferior spot yellow, these spots not so sharply defined as the markings on 2; remainder of abdomen, including the appendages, black.

Described from a single ♂ in my collection, collected by Ernest J. Oslar, Bear Creek Canon, Jefferson Co., Colorado, July 31, 1898.

So far as form of appendages go, this species finds its closest ally in *S. linearis*. No other species known to me approaches these two species in this type of appendage. *S. nasalis* is known to me only by DeSely's description of the female, but it certainly cannot be associated with *charadraea*. In addition to differences indicated in the figures of appendages, *charadraea* is separated from *linearis* by a number of charac-

ters, including size, reduction in number of antenodals and coloration. My type has been examined by both Dr. Calvert and Professor Needham. In the figures of appendages of *charadraea* it should be noticed that the apex of the abdomen has been flattened, so, in profile, segments 9 and 10 appear too wide, and in dorsal view, the apex of 10 is compressed and the superior appendages are crowded together.

Under date of November 14, 1906, Mr. Oslar writes concerning the single specimen:

"I took it at an altitude of about 8000 feet, July 31, 1898, in Bear Creek Canon, Jefferson County, Colorado. At the place I took it there were two, but, on account of its wariness and the almost inaccessible character of its haunts (on willows overhanging the swift and breakneck dashing Bear Creek), I was unable to secure the other specimen. The one captured was taken with difficulty, as it kept just out of reach of the net. It appeared a weak flier, however, and my opportunity came when an unusually strong gust of wind blew it towards me. I have never seen the like of it since, though I have visited the spot a number of seasons. I have always suspected that it might be new."

Notes on Plusiotis beyeri Skinner.

By C. R. Biederman, Palmerlee, Arizona.

Most of the letters I get ordering *P. beyeri*, contain questions about the insect, some complain of the high price, stating that it is reported this species is all over this part of the country and is plentiful. The latter statement is only partially correct, since it is not found above 6,500 or below 4,500 feet. Within that space I have found it for many miles along the Huachuca range. I have known *P. beyeri* since 1904. That season I found two specimens; next year, 1905, four; this season, 1906, I made a special study of this large and handsome *Plusiotis*, and from my experience I may safely conclude the following: That while there are a good many of these beetles within the space mentioned, I have utterly failed

to establish a rule whereby to locate a single one. There is no time of day it is not on deck; the noise of his wings in the night can be heard twenty feet away, whereas his flight in daytime is almost without sound. The length of his life is about three months, commencing on the 6th of July, when I found the first one while raking away leaves for a garden-bed. I concluded that this time of year they might be hidden under leaves, and so I started to rake leaves. I think I worked about ten hours, raked over a half acre of ground and never found another; this did not cure me, however, for at odd times I tried it again, and may have raked over in all about two acres without getting another, although I found some other good things, among them a litter of skunks under a log. The next find I made was a fine female, sitting at the foot of a large oak. This gave me the idea to examine all the old oaks for a mile either way along the Canon, but no sign of *beyeri;* the fact is, I found only three on the bark of trees; one, six feet up, the other twenty feet. I also found them in the road or trail, several crushed by animals, but all wide apart, as to both space and time. I found them copulating on the high branches of young and old oak; this set me to look at trees for miles and for days without result, except disgust. For several days I did not look for them, but collected other material, yet the habit once formed for looking for certain things persists so strongly that I could not keep from watching the tree tops. Although I was not thinking of *Plusiotis beyeri,* my eye caught the forms of two hugged close among the leaves. Before I had made up my mind how to take them, I saw two more higher up, and I felt like an Apache roasting a lot of sheep guts on a bed of hot coals. Thinking this the right time to hunt him good and hard, I looked for a week and did not get one. Later I found one here, one there; hanging to the dead stalk of a columbine, on the top of a bare precipice, in a prospect hole, an old well in a privy, a blacksmith shop, and one day in an old shoe. This is the way of *beyeri,* he is everywhere and nowhere in particular. When he walks on the ground he reels like a drunkard, and when he rolls over on

his back it takes him half an hour before he makes a motion to get on his feet.

So far as I can find out, he has no likes or dislikes to make him an easy capture, there is no particular place he prefers to stay, he don't belong to any club, he don't play golf or other games. Clubbing a tree for him won't do much good, as he grits his teeth and stays there, nine times out of ten. I conclude that he will not be exterminated by collectors, and before all the latter are supplied with a good series, some method of propagation must be invented.

Some recent work on the development of Hymenopterous Parasites.

By Dr. Wm. A. Riley.

In the Entomological News for September, 1905, I called attention to the discovery, by Marchal, of a new type of development, occurring in certain parasitic Hymenoptera. In studying the development of *Ageniaspis fusicollis* and of *Polygnotus minutus,* Marchal* found that a single egg, in the morula stage, would spontaneously break up and give rise to many distinct individuals. I referred to the observations of Pergande and of Giard, who found nearly three thousand individuals of *Litomastix truncatellus* in a single larva of *Plusia gamma,* and to Giard's prediction that here, too, would be found a case of polyembryony.

There has come to hand a paper by Filippo Silvestri† who has studied the life history of this parasite and brought to light many interesting and striking facts.

*Marchal, P. 1904. Recherches sur la biologie et la développement des Hyménopteres parasites. 1. La polyembryonie spécifique ou germinogonie. Arch. zool. exp. (4) ii, pp-257-335, pls. ix-xiii.

†Silvestri, F. 1906. Contribuzione alla conoscenza biologica degli imenotteri parassiti. 1. Biologia del Litomastix truncatellus. From Ann. Scuol. Agric. Portici., vi. 51 pp., 5 pl. and 13 text figs. This paper is a second preliminary note. The first, which summarizes the essential features of Silvestri's work, but is not illustrated, appeared Nov. 10, 1905, in the Rendic. R. Acad. Lincei. ser. 5, vol. xiv. pp. 534-542.

the larval organs of *Plusia* in its last days and thus preparing them to serve as nutriment for the sexual forms. If this be true, we have in *Litomastix* a larval dimorphism comparable to the polymorphism of social insects. The parasitic life, the factor which has acted to push back to the very egg stage the multiplication of the species, has served to bring about the precocious development of caste.

A new species of the Orthopterous genus Daihinia.

By A. N. CAUDELL, Washington, D. C.

Daihinia phrixocnemoides n sp.

Female.—Resembles very closely members of the genus *Phrixocnemis*, but the three segmented first and third tarsi preclude its being placed in that genus.

Head moderately large and broad; occiput rounded, front broadly convex; eyes small, not prominent; palpi with the terminal segment about equal in length to the previous one and concave beneath on the apical third and somewhat swollen. Pronotum rounded above, about as long as broad; lateral lobes very broadly rounded below, descending about the same distance as the descending lobes of the meso- and metanotum. Abdomen rounded above; ovipositor long and moderately slender, three-fourths as long as the third femora and curved gently upwards, the lower valves armed apically with five large recurved teeth, four ventral and one terminal. Legs stout; first and intermediate femora armed below on the inner, or front, margin with a small pregenicular spine; third femora unarmed, one-third as broad as long, nearly straight below, above strongly arched, only the apical sixth subparallel: first tibiæ stout and apically swollen, convex outwardly, concave inwardly, armed above with one stout, blunt, down-curved calcarium, and below, on the outer side, armed with four stout, blunt calcaria and on the inner side with four sharp spines, the terminal one very long and with a minute spinule just above it; middle tibiæ not swollen, armed on the rounded lower side with two rows of very fine spines, three spines on each side; besides these spines there are two long terminal spurs on each side, one above and one below; third tibiæ rounded below and sulcate above, considerably deeper and some broader at the middle, below armed on the outer side a short distance from the apex with a single very minute inconspicuous spine and at the apex with a pair of short, stout, black-tipped calcaria; above armed on the outer margin on the basal two-thirds with a num-

Litomastix truncatellus oviposits in the egg of various species of *Plusia*. The eggs of the parasite, which may be fertilized or parthenogenetic, are deposited singly, but occasionally the same female returns and deposits a second egg within that of the host. Several females may select the same egg, but this probably occurs rarely under natural conditions. The course of development of the fertilized and the parthenogenetic eggs is the same but, as in the bees, the fertile egg gives rise to females, while the unfertilized egg produces only males.

Silvestri found in the maturation and early segmentation stages of the egg, features of great interest from an embryological viewpoint, but too technical for discussion here. It may be mentioned in passing, that the polar nuclei and their protoplasm do not degenerate but, later, form an envelope which surrounds the germinal region.

In the development of the egg there occurs a process of polyembryony which, however, differs in detail from that reported by Marchal for *Encyrtus* and *Polygnotus*. One of the most striking features is that there are developed two very different types of larvæ. From a single egg there originate about a thousand normal larvæ of the form typical of endoparasitic hymenopterous larvæ. In addition to these, there are produced one hundred or more vermiform *asexual* larvæ. These lack any trace of circulatory, respiratory or genital systems, or of malpighian tubes. They are provided with strongly-developed mouth parts.

The sexual larvæ transform into pupæ when the host larva has completed its growth, and later, into adults. The asexual larvæ, on the other hand, degenerate completely, never giving rise to adults.

At first thought it might seem that these asexual larvæ are abortive forms, without special function. Considering, however, the development of their mandibles, and of the skeletal, muscular, and digestive systems, it appears to Silvestri natural to believe that, being able to penetrate readily the organs of the body of the host-larva and having mandibles especially adapted for tearing, they have the function of breaking down

9 mm.; ovipositor, 9 mm.; width third femora at widest point, 4 mm. 4 mm.

Type in U. S. Nat. Mus.

One female, Mesilla Park, New Mexico, August 12, 1898 (Cockerell).

This species is very distinct from *D. brevipes*. The latter is less variegated in color and the calcaria of the posterior tibiæ are not so conspicuously long. The claws of the new species are proportionately much longer than those of *brevipes*, and

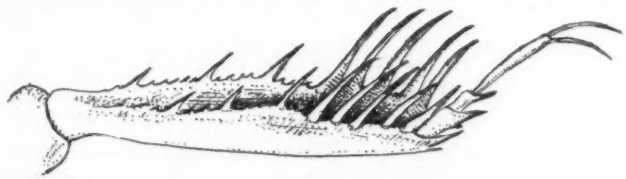


FIG. 1*a*.

the third tibiæ are straight on the lower side instead of slightly curved as in *brevipes*. The third femora of *phrixocnemoides* are apically about one-third as broad as the basal portion, while in *brevipes* the apical width is more than one-half the basal width.

Figure 1 shows the type specimen of *phrixocnemoides*, and figure 1a represents third leg much enlarged.

A new Mayfly of the genus Caenis.

By NATHAN BANKS.

The genus *Caenis* is one of the most distinct in the Ephemeridæ. Its species, however, being small, are little known. Hagen recorded two species from the Eastern States, and recently Dr. Needham has described a third. I have a new species from the West, described below, and another form from Florida. Dr. Needham has figured the wings of the three species; however, I do not find that there is as much difference in the venation as would appear from his figures. He shows the wing of *C. hilaris* with fewer cross-veins than *C. diminuta*, and both without anal cross-veins, yet in all the specimens

ber of fine teeth and on the apical two-thirds with nine long calcaria, whitish basally, black apically, the two basal ones and the apical one shorter, being about one-half as long as the broadest depth of the tibia, the other six very long, the longest being fully as long as the greatest tibial depth; on the inner side the third tibiæ are armed on a little less than the basal two-thirds of the undulating margin with a number of short black-tipped teeth, similar to those of the outer margin, and armed with nine long heavy calcaria arranged about as those of the outer side, but the long calcaria much longer, the longest being decidedly longer than the greatest tibial depth. First and third tarsi tetramerous, the first and second segments short, the

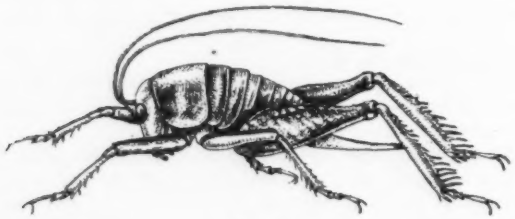


FIG. 1.

second little more than one-half as long as the first and both together scarcely one-half as long as the third; the two basal segments are produced ventrally as blunt, naked, black-tipped projections, the basal segment of the hind tarsus having a stout triangular tooth about the middle beneath; the third segment of both the first and third tarsi are cylindrical and the claws are very long, more than two-thirds as long as the apical tarsal segment and thick basally, apically tapering and infuscated. The middle tarsi are pentamerous, the basal and apical segments subequal in length, the intermediate ones very small, the second closely united to the basal one, none ventrally produced as are those of the first and third tarsi. The claws of the middle tarsi are less elongate than those of the others.

Color brown and light yellow, the first and intermediate legs, the lower half of the head, the ventral margin of the lateral lobes of the pronotum, the ovipositor and the margins of the abdominal segments being the latter color. The inner face of the third tibiæ, the base of the calcaria and spines and the third tarsi as well as the antennæ, at least basally, and the body of the black-tipped palpi are also light yellowish, and the face and outer disk of the third femora are mottled with it.

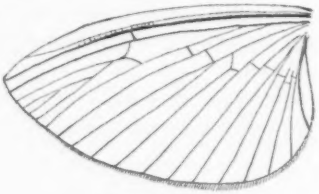
Length, pronotum, 4.5 mm.; third femora, 12 mm.; third tibiæ,

of this genus that I have seen, the anal cross-veins are present as well as all those shown for *C. diminuta*. The difference is in the distinctness of these veins, the anal, and sometimes some of the others, only can be seen when held against the light; moreover, there is variation in this distinctness, and in the position of these cross-veins, while additional cross-veins are sometimes present. In his figure of *C. allecta* Dr. Needham shows the last fork of the radial forks arising from the lower instead of the upper branch; this is not mentioned in the description, but is different from all specimens seen by me.

My new species differs chiefly by its broader wings, and I shall therefore call it

C. latipennis n. sp.

Thorax pale, shining brown, paler on sides; abdomen dull brown above, paler beneath; legs pale, tips of femora darker; setæ pale, faintly annulate with brown; wings whitish, the subcosta and radius very dark and prominent; the anterior cross-veins to median fairly distinct, those behind very faint. The marginal hairs of wing are very



Cænis latipennis.

short near tip, but longer behind toward base. Tibia of male plainly more than twice as long as femur. Anal stylets long, and sharp-pointed as figured for *C. diminuta*.

Expanse 8 to 9 mm.

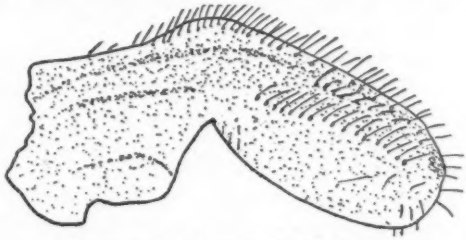
Several specimens from Pullman, Washington, June.

MR. J. CHESTER BRADLEY, formerly of Philadelphia and Ithaca, is now Laboratory Assistant in Entomology at the University of California, at Berkely. Mr. Bradley is at present inspecting orange groves near Los Angeles and San Diego. We wish him great success in his new environment.

Notes on the Subapterous Female of Tipula simplex Doane.

R. W. Doane, Stanford University.

Early in March, 1906, while collecting in a meadow near Stanford University, I found thousands of Tipulids half flying, half running over the grass. Many were collected, and all proved to be male specimens of *Tipula simplex* Doane. Although it is not uncommon to find the males of several species of *Tipula* issuing somewhat earlier than the females, the very great abundance and the peculiar actions of this species, running frantically over the grass, rarely flying and then not rising more than a few inches, caused me to make



Rudimentary wing of female *Tipula simplex* Doane.

a particularly close search for the females, but none were found at the time. Two days later, in another place where the males were again abundant, a few females were found crawling slowly over the ground in the thick grass, sometimes crawling up on the grass. They were, as the action of the males had led me to expect, unable to fly. The wings were short and rudimentary, being about as long as the halteres, distorted in shape, entirely veinless and with rows of rather long, stiff hairs along the costal margin in the anterior distal portion. The accompanying figure will give some idea of the shape of the wings and the arrangement of the hairs. In other respects the female is similar to the male, except that the legs are much shorter and stouter. The ovipositor is reddish-brown, the upper valves rather wide at the base, tapering to a sharp point and curving slightly outward at the tip. The lower

valves are broader and blunter and do not reach the tip of the upper valves.

As the early part of March was stormy, but little collecting was done, and only eighteen females were taken. Two pairs were taken mating, and one female was seen with her ovipositor thrust into the ground, evidently depositing her eggs, but no eggs were found. A few pupæ, but no larvæ were found.

We have, of course, a number of apterous or subapterous forms throughout the Diptera, the two conditions being, indeed, found in the Tipulidæ. The genus *Chionea* being entirely wingless, and the species recently described by Cuquillett, (Can. Ent., Vol. XXXVII, p. 347), assigned provisionally to the genus *Limnophila,* in which both the male and the female have abortive wings.

It is difficult to conceive what combination of forces or tendencies have been at work to bring about this particular anomalous condition. We can easily see why it would be advantageous for the parasitic forms living among the hairs or feathers of their host to be wingless. We also think we can see the advantage the wingless or short-winged forms have over the winged forms in regions where the latter are more or less apt to be carried to their destruction by the winds. Thus it is assumed that *Calycoptera moseleyi* Eaton and others on the Kerguelen Islands have gradually lost their wings through a process of natural selection, and we can conceive that the snow-loving *Chionea* and the subapterous alpine *Limnophila aspidoptera* possess an advantage over flying forms living under similar conditions. But none of these explanations have any force in the present instance. The fact that practically all of the Tipulids are winged and are able to fly considerable distances is certainly good evidence that the winged forms are well fitted to their environment. But here we have living under exactly the same conditions as to time, place, temperature, etc.; this wingless form, which, if numbers count for anything, is certainly a successful form. It seems that some explanation other than that of natural selection will have to be looked for if we are going to "explain" such cases.

Notes on Certain Cranberry-Bog Insects.

By H. J. FRANKLIN, B. S., Massachusetts Agricultural College, Amherst, Mass.

During a five months' stay in the Cape Cod Cranberry region, from May 1st to the last days in September of the present year, I was engaged in studying the insects generally considered as being economically important in the cranberry industry. As was natural, I made a considerable number of observations on other species and a portion of these are presented in the following notes.

The larvæ of the Geometer *Cymatophora sulphurea* (Packard) were found in considerable numbers on several cranberry bogs located in the towns of Carver, Wareham and Falmouth early in June. They were so abundant and their manner of feeding was such that they had a marked effect on the crop of berries harvested on one bog. Before the bud at the tip of the upright shoots had been developed to form the new growth, these larvæ began their feeding, and the bud at this time being the most tender part of the plant it was the portion chosen almost exclusively by the caterpillar for its food. On the bog where these larvæ were found in greatest abundance the winter flowage was held late in the spring and the buds had not yet developed into the new growth to any considerable extent even early in June. The caterpillars were at this time feeding voraciously on these buds. Often the entire bud was devoured, but as a rule, only the central portion was eaten out, leaving an outside shell. The larva and pupa of this species have not heretofore been described.

Full-grown larva.—Length, 18 to 20 mm.—General color light green. Head normally rounded; lighter in color than the body and not as distinctly green; without mottlings or markings, with the exception of a narrow cream-colored stripe on each side extending horizontally from the base of the mandible to the hinder margin, where it merges into the lateral body stripe. Body somewhat larger toward the posterior end; finely striped the entire length, both above and below, with longitudinal whitish lines, those on the dorsum being much more distinct than those on the venter. Sides of body with a narrow cream-colored stripe running the entire length, just below the spiracles, from the

head to the base of the anal proleg and joining anteriorly the stripe on the head already described. Surface of body bearing short sparsely scattered hairs (see Figs. 1 and 2). Spiracles small, chestnut brown. Anterior prolegs each bearing from seventeen to twenty crotchets which are subequal in length and arranged on a crescentic pad in a

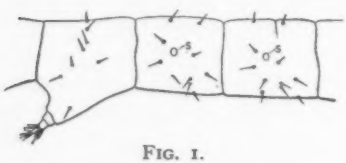


FIG. 1.

FIG. 2.

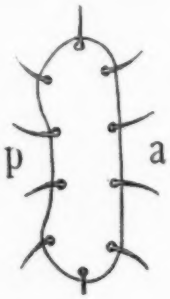


FIG. 3.

Fig. 1.—Arrangement of tubercles and hairs on the metathoracic and first two abdominal segments of the larva of *Cymatophora sulphurea* (Pk.), full-grown. S. spiracles.

Fig. 2.—Arrangement of tubercles and hairs on some of the posterior abdominal segments. S., spiracles; a. p., anterior proleg.

Fig. 3.—Cervical shield showing arrangement of its tubercles and hairs.

single row. Crochets of each anal proleg numbering from twenty-five to twenty-eight and arranged in a crescentic row similar to that on the anterior prolegs. Venter lighter colored than dorsum and sides.

Most of the larvæ found in early June pupated by the middle of the month. Pupation on the bog took place in the sand beneath the vines.

Pupa.—Length, 8 to 10 mm.—Greatest width, 2½ to 3 mm. General color dark chestnut brown to black. Abdominal segments strongly punctate. Cremaster straight and sharply conical; in some specimens more or less bifid at the tip, with straight, sharply pointed branches.

Cymatophora sulphurea (Packard) is at least two-brooded on Cape Cod. The adults of the first brood begin to emerge soon after the middle of June and continue to appear until into

July. This first brood continues on the wing until near the middle of this month. The second brood, which in all respects resembles the first, reaches the imago stage during late July and early August. The moths were found flying on every bog which I visited during their time of flight. The females and males of this species both vary somewhat in coloration. The males are always considerably the lighter, some specimens, even when they first emerge, having almost no yellow tinge at all in their coloring. All the females which I reared were on their first emergence strong sulphur-yellow in color. The dark spots usually so conspicuous in the female are in the male often very obscure.

During the month of July the larvæ of the Geometer *Tephroclystis miserulata* (Grote) were found eating holes into the unripe cranberries on a considerable number of bogs, and in some cases were quite abundant. They were also found in a few instances eating similar holes into the unopened buds of *Rhexia virginica* L.

During June, *Sphinx gordius* Cramer was found in small numbers on several bogs. Late in August and in September, its full-grown and nearly full-grown larvæ were also found feeding on the cranberry vines. This was the only *Sphinx* found on any of the bogs.

Epidemia epixanthe (Boisduval and LeConte) was found flying in great numbers on nearly every bog visited during late June and July. The larvæ were certainly not found on the cranberry vines, and it is still a question as to what the food plant of this species is. It seems to be a common bog insect over the entire Cape.

The larvæ of *Epagoge sulfureana* (Clemens) were found on cranberry vines in small numbers, feeding in a manner very similar to that of the larvæ of *Acleris minuta* (Robinson). After the larvæ became full-grown, they pupated in the spun-up tips as do the larvæ of *A. minuta.*

The larvæ of the Noctuid *Glaea sericea* Morr. were discovered during late May and June feeding at first on the buds at the summit of the old growth and later on the new growth which devel-

oped from them. These larvæ became full-grown and went into the earth to pupate during the last ten days in June and the first days in July. They reached the period of general pupation about the first of August, and the single moth which I reared emerged on October 6th.

Full-grown larva.—Length, 29 mm.—General color of body light chocolate-brown. Head light yellowish brown and faintly mottled. Tip of mandibles black. A whitish stripe runs the entire length of the body from just back of the head to the anal proleg on each side, passing just below the spiracles and partially including some of them. Occiput of head and collar with an inconspicuous median longitudinal whitish line. A slight dark median shading runs the entire length of the body from just behind the collar. There are also two pairs of inconspicuous dark spots on the dorsum of each of the abdominal segments, the two spots of the posterior pair being placed farther apart than those of the anterior pair.

Pupa.—Length, 17 mm.—Color, light brown. Surface smooth, not punctate. Cremaster consisting of several (about four) straight sharp spines.

NEW JERSEY is a place where any genus or species of insect may be found by those who have sufficient faith, and in addition to that it has a wonderful extinct animal. Mr. Rockefeller was very anxious to secure a specimen of the great *Hadrosaurus foulki*, fifty feet high, a specimen of which had been found in a marl pit. The Professor of Palæontology of the University of Chicago was sent out to secure a specimen. While crossing the dangerous pine barrens and in ascending a sand dune he severely sprained his ankle. Great was the consternation when he did not get back at the appointed time. The President of the University telegraphed to the Governor of Illinois, the latter communicated with the Governor of New Jersey, who 'phoned to New Brunswick and at once ordered the State Entomologist to send out a relief expedition. It arrived just in time. The learned Professor was on his back, nearly exhausted, with the left femur of a *Hadrosaurus*, five feet long, grasped in his right hand. Swinging this in the air he was beating off to save his life, clouds of *Coelodiazesis, Cyclolepidopteron, Lutzia, Ceratocystia, Pneumaculex, Panoplites, Deinocerites, Ochlerotatus, Culicelsa, Pseudoculex, Culiseta, Culicella, Melanoconium, Mochlostryax, Sabethoides, Lesticocampa and Aldiborontifoscofonium.*

A Jerseyman, a member of the rescuers, said the poor man nearly lost his life from a joblotia of mosquitoes.*—*Newspaper.*

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*See *Canadian Entomologist* for Dec., 1906, p. 384.

On Phrynotettix magellanicus Bruner and Tristira bergi Brunner (Orthoptera).

By JAMES A. G. REHN.

In 1872, Glover, in his illustration of North American Entomology (Orth., pl. vi, fig. 25), applied the generic name *Phrynotettix* to the figure of a species of the genus later called *Haldmanella* by Saussure,* who apparently had never seen Glover's work. In a work published several years before the one containing *Haldmanella,* Saussure described a peculiar South American genus of locusts and applied the name *Phrynotettix* to it.† From this it will be seen that *Phrynotettix* must date from Glover and should be used in place of *Haldmanella,* which has already been done by the author,‡ *Phrynotettix* Saussure falling on account of preoccupation. The latter genus was described by Saussure as a member of the Oediopodinæ.

In 1900, Bruner described a species of *Phrynotettix* Saussure|| from the Straits of Magellan, and two months later, Brunner von Wattenwyl independently described the same species as a new genus and species of Truxalinæ—*Tristira bergi.*§

Eary in 1906, the author recorded specimens as the latter species, overlooking Bruner's species, as its proper relationship appeared to be with the Truxalinæ (Acridinæ).

A re-examination of the material sustains the opinion that closer relationship exists to the Acridinæ than to the Œdipodinæ, but the proper position of this as well as several other genera is debatable. From the evidence given above, it is obvious that *Tristira* must be used as the generic name and that *magellanicus* Bruner has priority over *bergi* Brunner, the correct combination being *Tristira magellanica.*

*Addit. Prodr. Oedipod., pp. 123, 153. 1888.

†Prodr. Oedipod., pp. 47, 99. 1884.

‡Proc. Acad. Nat. Sci., Phila., 1902, p. 595.

||Acc. Gen. Spec. Locusts Agent., p. 44. Exact date according to Bruner (in litt.), Aug., 1900.

§Comunic. Museo Nac. Buenos Ayres, I No. 7, pp. 235-236. Oct. 9, 1900.

Rare Butterflies.

By Henry Skinner.

The following question has been asked :—Kindly state in the News what is considered the rarest butterfly in North America? That is a very difficult question to answer and may be evaded by asking What is a rare butterfly? or in other words, what is meant by the term rare. We will consider the question first from the standpoint of rare in collections. A butterfly may be very rare in collections but very common in nature. Butterflies may be rare in collections from the following reasons: They may live in localities remote from resident collectors; they may be found in places rarely visited by collectors on account of distance or inaccessibility; they may be scarce in nature and restricted to a comparatively small area. As a general rule they may be said to be abundant at the proper place, in a given year, in the appropriate season. There are certain names in our lists that represent species of more or less doubtful validity and are probably synonyms, and these make a class that may be called rare for obvious reasons, but need not be considered here. As a subclass under this heading may be considered aberrations that have been given names but seldom recur in nature.

A few species that are rare in collections may be considered. *Argynnis nokomis*, so far as I am aware, has not been taken for over twenty years. The late Berthold Neumoegen received a number from somewhere in the vicinity of Kanab in southern Utah, and supplied most of the collections in the early eighties. *Argynnis nitocris* was described in 1874. About seven years ago Prof. T. D. A. Cockerell found it in abundance. Prof. F. H. Snow has also taken some of recent years. This butterfly was scarce because it flies late in the season (after August 15th), and is only found, so far as known, at an elevation of about 7200 ft. *Argynnis atossa* is one of the rarest butterflies in collections. It has never been found outside of a certain place at a certain elevation in the Tehachapi Mountains in southern California. *Argynnis astarte* was described in 1848 and not refound until 1891. It is still rare in collections but is probably found over a large extent of country at certain alti-

tudes. *Melitæa albiplaga* Aaron is only known from the unique type. It may prove to be an aberration of a common species. *Cystineura cana* has been found but once in the United States. One specimen of *Myscelia skinneri* has been found in New Mexico. *Junonia negra* Felder is only found in southern Arizona and is apparently rare there. A butterfly that is probably only in two collections in the United States is *Debis creola*. It is doubtless common in places on the Gulf coast of Louisiana and Texas. Another rarity in collections is *Neonympha mitcheli*, but it is common in certain parts of Michigan. *Cœnonympha kodiak* comes and goes in its northern home, but seldom finds its way into the cabinet. *Cœnonympha haydeni* was very rare until its headquarters were found in Idaho and the Yellowstone. This will be the history of most of them. *Erebia fasciata*, *rossi*, *vidleri* and *magdalena* all delight the eye of the collector as they are all rare in the cabinet, as people don't go every day to Mount Cheam and the other localities in the far north. *Satyrus pegala* comes from a section of the country where there is little interest in entomology and consequently is a very desirable fly. *Satyrus wheeleri* from Owen's Lake is a very rare species. *S. sthenele* is possibly the rarest in collections as it is probably extinct. *Chionobas peartiæ*, in honor of Mrs. Mary Peart, one of the greatest entomological artists that ever lived, is only known from type material as it was found in Victoria Land, British America. *Lemonias duryi* is almost unknown to the collectors. *Thecla wittfeldi* has not been found since the original catch in 1883. The vegetation on the spot where Dr. Wittfeld took it, on the Indian River, Florida, has been destroyed by cultivation. *Thecla ontario* is one of those doubtful things that I have never seen. Our Canadian friends should tell us what it is or is not. *Thecla acis* was a great desideratum until collectors became frequent visitors to South Florida. For a butterfly that has been found from Canada to Arizona, *Thecla læta* is very rare in collections and is also an excellent illustration of a butterfly found over an immense area and so far as known nowhere commonly. *Chrysophanus hermes* was probably only in two or three collections but is now being taken in some numbers, and its life history is likely to be published. A little butterfly rare in

collections but common in parts of the West is *C. zerœ*. *Lycæna xerces*, supposed to be extinct, has come to life, but is very local. *Lycæna lotis* is a very rare butterfly if it is a valid species, as the writer never saw one. The locality is Mendocino, Calif. *L. aster* from Newfoundland is a great rarity in collections. *Lycæna striata* is also unknown to the writer of this article. *Neophasia terlooti* was described in 1869 and not again found until 1900. *Fieris ochsenheimeri* from Alaska is in two collections only. *Anthocharis pima* was unknown in collections for a number of years. Arizona and its fauna is becoming better known every year, although there are vast tracts and many mountain ranges yet to be explored. *Colias boothi* is probably very common in Boothia-Felix, but there is only one specimen of it in the United States. It is probably the rarest butterfly that is still living. *Colias behri* is a good illustration of a butterfly that is rare in collections on account of a limited geographical range. It is an alpine species found about the Yosemite Valley, California. The golden *Parnassius eversmanni* is a very great rarity in collections, but is beyond doubt very common in its native haunts. *Papilio nitra*, *indra*, *pergamus*, *brevicauda*, *pilumus*, *cresphontinus* are all good ones and lucky the collector that has them all. *Ancyloxypha longleyi* was found near Chicago, Illinois, where there are numerous collectors, yet there is but one specimen known. There are certain names in the Hesperidæ that represent more or less doubtful species and we will only refer to rare valid species. The following are rare in collections: *lasus*, *cabelus*, *rhesus*, *carus*, *licinus*, *meskei*, *verus* (the latter is a variety of *nemorum*), *morrisoni*, *chusca*, *mardon*, *bellus*, *loammi*, *lunus*, *panoquinoides*, *errans*, *python*, *cestus*, *yehl*, *lagus*, *arogos*, *arabus*, *carolina*, *libya*, *outis*, *drusius*, *hesus*, *copafui*, *streckeri*. To refer to the original question again. The rarest butterfly found in North America may be said to be a valid species, represented in a single collection, by one specimen, and it the most difficult species of which to obtain additional material. What is it? The rarest species in nature is the one confined to the least geographical area and producing the least number of individuals. What is it?

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., JANUARY, 1907.

For several years it has been our custom to figure the most interesting or remarkable insect described during the year and illustrate it on the cover of the January NEWS. We have asked for suggestions in regard to this matter, but for the year

Syntomeida befana Skinner.

just closed we have had none. The species figured here is probably not by any means the most remarkable but it was available and so here it is. Prof. F. H. Snow discovered the species in the Baboquivari Mountains in Arizona. It was described in this journal on page 379, Dec., 1906.

The great necessity for economy of time and energy in routine work in entomology is painfully apparent. This is the age of insects and many of us fully recognize the great value of the study. The subject is such a vast one and the workers so comparatively few, that the necessity for modern aids of

St. Louis, Sept. 26th.—Myriads of butterflies, all moving by flock in a general southerly direction over the city, sometimes circling, attracted much attention this afternoon, particularly in the business streets.

Little groups of people craned their necks and shaded their eyes against the sun while they stared at the unusual spectacle. The butterflies were very large, some measuring about three inches from tip to tip of their wings, and were of a light brownish color.

The main body of the flock flew high in the air, well above the roofs of the tall buildings.

There is nothing that Dr. F. H. Snow brought back from his recent collecting expedition in Southern Arizona that he prizes more highly than the Gila monster, which he captured shortly before his return to Lawrence, which gained considerable notoriety by biting him on the thumb. The last five weeks since the return of the expedition the monster has spent in a cage in Dr. Snow's back yard and seems to like its new Kansas home fully as well as its former habitat in the southern hills of Arizona. It has not been sick a single day of its captivity and takes its meals of raw eggs every three days as regularly as clock work.

Gila, as Dr. Snow calls the creature for short, is a large lizard, being a little more than a foot long and has a head nearly two inches wide. Its mouth is amazingly large and is entirely out of proportion to the rest of the body. Its body is yellow and dark brown and at a short distance looks like Indian bead work.

Hour after hour Gila will lie in its cage without moving and appears as if it were dead, but stir it up with a stick or let it get angry and it will crawl around at a wonderfully fast pace. It is gentle and will never bite unless it is tormented or angry. Once let it get angry and it will seize the end of a stick or anything thrust at it and hold on for dear life.

To watch it eat is an interesting sight. In nature the Gila monster lives on insects, but thus far in captivity it appears to be thriving on raw eggs. After a little experimenting Dr. Snow has found that every three days is the right time to feed the creature. When the time for feeding arrives he grabs the lizard by the neck and lays it out on a table or flat box. He then cracks an egg in a saucer and thrusts the creature's nose down in it and the Gila does the rest. It stretches out its long tongue into the saucer and greedily laps up raw egg until it has a mouthful. Then it slowly raises its head to a vertical position and lets the egg run down its throat. After it has once started eating, Gila needs no urging, but laps away greedily until its hunger is satisfied. The last time Dr. Snow fed the animal it finished two raw eggs.

It would hardly be correct to call Gila a family pet, for all the members of Dr. Snow's family are afraid of it except Dr. Snow. As far as he is concerned, however, he handles it about fearlessly in spite of

various kinds is very great. Fortunate are those who can escape various kinds of drudgery. What would the business man of to-day think if he were obliged to do without a stenographer, typewriter, filing cases and other things of like character? Many entomologists could turn out more and better work if they were so situated as to command these necessities. Almost no financial aid comes to entomology as compared with other researches of natural science, and yet we firmly believe that there is not one that exceeds it in importance. We sincerely trust that this condition will not continue. It is very gratifying to see that in far-off Africa, the ice in this respect is being broken. We refer to the splendid second report of the Wellcome Research Laboratories at the Gordon Memorial College in Khartoum.

Entomological Literature.

OBSERVATIONS ON THE STAPHYLINID GROUPS ALEOCHARINAE AND XANTHOLINI, CHIEFLY OF AMERICA.—By Thos. L. Casey. Transactions of the Academy of Science of St. Louis. Vol. 16, No. 6. Issued November 22, 1906.

This work of 309 pages is devoted to a study of groups of small Coleoptera which have been much neglected. The author says: In the Aleocharinæ, the parts of the series selected for present review are those which are of more general interest and therefore somewhat systematically collected, although this is only true in a relative sense, there being many most interesting genera and species still to be discovered. Besides these groups of the Aleocharinæ, a revision of the tribe Xantholini is presented, based upon such material as could be conveniently brought together. Many new genera and species are described. The author is to be congratulated on presenting to entomology such a valuable contribution to the literature of the subject, and it is to be hoped that it will stimulate a greater interest in a rather neglected family of the beetles.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

It has been found that there are 900,000 separate kinds of bugs in Missouri. It would appear from complaints in the Boston papers that there are only two kinds in Massachusetts—the gypsy and brown-tailed moths. *Newspaper.*

PROF. H. A. PILSBRY of the Academy of Natural Sciences of Philadelphia has just returned from Arizona. He collected a number of insects most of which were taken in the Chiracahua Mountains.

Mr. Matthews exhibited specimens of *Periplaneta americana*, and related his experience in trapping them. He showed winged and wingless forms.

HENRY SKINNER, *Secretary*.

A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held September 27, 1906, Dr. D. M. Castle presiding. Thirteen persons were present.

Dr. Skinner exhibited a bred ♂ of *Platysamia gloveri* from the Huachuca Mountains, Arizona, and spoke of the differences between its larva and that of *cecropia*. He also exhibited *Hepialus thule*, a rare species found at Montreal, Canada.

Mr. Daecke said he had located some pitcher plants at Toms River, New Jersey, and determined to examine them this season for *Papaipema appassionata*. He found the workings on September 22d, and exhibited them, but was too late in the season to get imagos. He also called attention to a method of making double mounts and exhibited the process. Number 00 black pins are put through the insect in the ordinary way; the pin is bent at a right angle under the insect and then pinned into a small piece of polyporus fungus which is on the larger pin. The excess of the small pin is removed with cutting pliers.

Mr. Viereck said during the summer he had been delegated by Dr. Samuel G. Dixon, Commissioner of Health, to make a mosquito survey of Pennsylvania. He had one assistant, Mr. J. Irwin Zerbe. The principal object in view was to combat malaria, and all the principal cities were examined. Attention was also given to a typical Canadian zone town in Sullivan County, and especial attention was given to the valley of the Susquehanna, as all evidence seemed to point to this being the strategic river valley in the crusade against malaria in the State. *Culex pipiens* was found breeding by the billion where no *Anopheles* could be found, but in this case the water was adulterated from refuse discharged by a glue factory. This is possibly the reason for the paradox here. In the acid waters and the oily waters of the coal and oil regions, respectively, no mosquitoes of any kind were found, nor were mosquitoes found breeding in certain cities where every depression

the fact that it has bitten him once. He took it in the house the other day and, being called out of the room, placed it in a waste paper basket for safe keeping, putting a sofa pillow on top of the basket to keep it from escaping. Before Dr. Snow returned Gila had decided to explore a little, and, crawling up the side of the basket, pushed off the sofa pillow and made its escape. Nothing more was seen of it for several hours, when the family, not wanting to have a live Gila monster roaming around the house any longer, began a determined search for it and finally found it snugly hid behind some books in the bookcase.

The question of whether the Gila monster bite is very serious or not is a much disputed one, but Dr. Snow believes it is not.

"The effects of a Gila monster bite have been much exaggerated," said Dr. Snow in discussing Gila monsters, and his own pet in particular. "Of course I have not had so very much experience with them, but so far as I could judge I should not call it very dangerous. The one I have in my back yard planted six teeth securely in my thumb, and I suffered no ill effects from it other than from the mere pain of the bite. The prompt application of an antidote which I had on hand, however, may have had something to do with my escape from sickness. A ranchman near where I was bitten seemed much concerned over the accident and told several instances of people having to spend weeks in a hospital as a result of a Gila monster bite."

Doings of Societies.

A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held May 24, 1906, Mr. Philip Laurent, Director, presiding. Ten persons present.

Mr. Ilg exhibited specimens of *Anthocharis genutia,* showing variation in size.

Mr. H. L. Viereck said he was preparing a work on the Hymeroptera of Connecticut, with an introduction, containing tables for the separation of families, genera and species, with notes on the latter. He thought the work would number not less than five hundred pages.

Mr. Coxey exhibited a collecting paper for insects, on which was printed blank forms for entering data.

Mr. Viereck advocated a study of the relation between the weight of insects and their wing expanse, for furthering a knowledge of aerial navigation. Mr. Wenzel said insects usually fly against the wind and their navigation is the reverse of that of a balloon.

had been filled in with material in the course of city development. The breeding of mosquitoes was always found greatest where interference with nature's balance by man was most marked. *Anopheles punctipennis* always greatly outnumbered *A. maculipennis.* It seemed quite evident during the course of the visits, that there was no demand for talks on the subject of mosquitoes as there was in the summer of 1903. This indicated to them that there had been a decline in the enthusiasm over the subject.

Seemingly unpardonable ignorance of basic facts and principles in entomology was detected, even among physicians, and in general it was noted that the dubbing of everything that crawls with the term "bug," is still too widespread. It seemed to them that this is due to the fact that entomologists seem loath to translate their study to the public through collections and articles. Hence they are impelled to wish that entomologists may become more concerned in giving their study the place it deserves in the public estimation, and in dispelling, among other things, the allusion to an insect as a despised bug.

HENRY SKINNER, *Recorder.*

A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held November 22, 1906, Dr. D. M. Castle presided. Thirteen persons were present.

Mr. Ilg presented eighteen specimens of blown larvæ.

Mr. Rehn reported the gift of eighty-nine species of Orthoptera, by Mr. Biolley, from Costa Rica.

Dr. Calvert described his trip to Mexico during the past summer. He visited Hermosillo and Nogales in Sonora; Guzman, Chihuahua City and Santa Rosalia in Chihuahua; Torreon, San Pedro and Saltillo in Coahuila; Zacatecas, Aguascalientes, Queretaro, Lake Chapala, Guadalajara, Mexico City, Orizaba, Jalapa, Popocatepetl Park and Toluca. The collecting at these various places was described. No new species of Odonata were found. One species new to Mexico was taken, *Libellula flavida* Hagen not Ramb.

Mr. Rehn exhibited some remarkable forms of Orthoptera purchased by Mr. Hebard.

Mr. Viereck made a communication on the parasites of man and spoke especially of insects as factors in the transmission of disease. The fact that under certain conditions insects change their hosts was mentioned.

Mr. Daecke said in regard to a previous communication he had made an error. At Weymouth, N. J., he had found Yucca. He showed the stems from which he had raised a number of moths which he thought were *Pronuba yuccasella,* but on further investigation they proved to be *Prodoxus intermedius.*

Pronuba yuccasella only breeds in the capsules or seed pods. The pupa cases of the two show remarkable differences. The *Yuccasella* pupates on the ground; the larvæ of *intermedius* do not leave the plant.

Dr. Skinner exhibited a picture of the larva of *Crinodes biedermani* made by Mr. Weigand.

HENRY SKINNER, *Recorder.*

A meeting of the American Entomological Society was held June 28, 1906, Dr. P. P. Calvert, President, in the Chair, and ten persons present.

Mr. C. Few Seiss presented a piece of ebony perforated by the so-called ship-worm (*Teredo*), which was turned over to the Conchological Department of the Academy of Natural Sciences.

Mr. J. A. G. Rehn said he had received some interesting Orthoptera from Prof. C. F. Baker, taken on Mt. Tyndall, in California. A *Bradynotes* and a *Hippiscus* were of especial interest. The *Hippiscus* represented a small species compared to those taken at lower elevations where much larger species in the same genus occur. Also a katydid taken by C. R. Biederman at Florence, Arizona.

Mr. E. Daecke reported the capture of *Cordulegaster maculatus,* at Lacey, New Jersey, on May 27th, this being the second specimen recorded from the State. On June 24th, at Browns Mills Junction, he took *Hagenius brevistylus* while it was in the act of capturing *Dorocordulia lepida. Chrysophanus epixanthe,* June 17th, and *Gastropacha americana* on April 29th, were

recorded from the same locality. On June 3d, at Dacosta, N. J., he captured *Tetyra bipunctata*, a hemipterous insect, representing a family new to the State.

Dr. Calvert said in his work on the Biologia Centrali-Americana, he was particularly interested in the study of widely distributed species and mentioned the coast form *Erythrodiplax berenice*, which is found from New Jersey southward to Panama. Going from north to south, the veining of the wing in this species becomes less dense. The same speaker also made remarks on the transition or intergradation of butterflies and beetles, as they are distributed from north to south.

Dr. Skinner exhibited *Xylophanes falco*, a sphynx moth from the Huachuca Mountains, Arizona, and new to the United States. It was captured by C. R. Biederman.

HENRY SKINNER, *Secretary*.

A meeting of the American Entomological Society was held October 25, 1906, Dr. Calvert, President, in the Chair. Nine persons were present.

Mr. Ilg presented twelve blown larvæ to the collection. He also exhibited specimens of *Utethesia bella*, showing variation, and among them two specimens of *U. ornatrix*, all found at Philadelphia. He was inclined to believe that *bella* and *ornatrix* were not different species.

Dr. Calvert said five specimens of *Tenodera sinensis* were seen in Woodland cemetery, West Philadelphia, during the second week of October, which had probably been introduced from the adjoining grounds of the Botanical Garden of the University of Pennsylvania.

He also said the *Argia translata* ♂ taken at Roxborough, Philadelphia, by Mr. Haimbach in 1905 was the first record for Pennsylvania. The same gentleman took two female specimens in the same locality this year. It was described from Venezuela.

Dr. Calvert captured *Chrysina macropus* under the electric lights in Jalapa, Mexico. He also saw the species flying during the day.

HENRY SKINNER, *Secretary*.